

**Amendment to the Drawings:**

*The attached Replacement Sheets of drawings include changes to FIGs. 1, 2 and 3.*

*In FIG. 1, dashed boxes for the beamformers (7B and 7'B) and blocking filters (B and B') have been added. In addition, the microphone outputs ( $u_1$  and  $u_2$ ) and echo canceling means (g') have been appropriately labeled.*

*In FIG. 2, appropriate labels and arrows have been added to highlight the echos in the form of early reflections (labeled as the "first part") and later reflections (labeled as the "second part" and including arrows pointing to the same) of the impulse response as a function of time.*

*In FIG. 3, the reference numeral "3" identifying the microphone array has been added.*

Attachment: Replacement Sheets  
Annotated Sheets Showing Changes

## **REMARKS**

By this amendment, the specification and drawings have been amended. In addition, claims 1 -8 have been amended. Claims 1-8 remain in the application. This application has been carefully considered in connection with the Examiner's Action. Reconsideration, and allowance of the application, as amended, is requested.

### **The Drawings**

The drawings stand objected to because the drawings fail to show "the beamformer 7B", signals  $u_1$  and  $u_2$ , blocking matrix B in Fig. 1 as described in the specification. Applicant notes the objection and has amended Figures 1, 2 and 3, as presented herein, to include appropriate representations for each of the elements. Support for the amendment to the drawings can be found in the specification, at least on page 4, lines 17-30. Accordingly, the objection of the drawings has now been overcome and should be withdrawn.

### **Objection to the Specification**

Various amendments have been made to the specification to correct for minor typographical errors and to clarify reference numerals and references to the drawing figures, as appropriate. No new matter has been introduced.

The abstract stands objected to as not commencing on a separate sheet in accordance with 37 CFR 1.52(b)(4). As presented herein, the specification has been amended to place the abstract on a separate sheet. Withdrawal of the objection is respectfully requested.

The specification stands objected to as not containing all the necessary sections required. Applicant notes the objection to the specification and respectfully declines to add headings, as they are not required in accordance with MPEP §608.01(a). Withdrawal of the objection is respectfully requested.

### **Rejection under 35 U.S.C. §112**

Claims 1-8 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. This rejection is respectfully traversed for at least the following reasons.

Various amendments to the specification, drawings, and claims have been made to facilitate placing the specification, drawings, and claims in better form and for providing clarification of the same. For example, in one aspect, the amendments help to clarify the meaning of reverberation, reverberation tail, and reverberation types of distortion, and how the claimed invention operates with respect to the same, such as described in the specification at least on page 2, lines 3-13; page 3, lines 1-2, 5-8, 17-18 and 28-33; page 4, lines 17-30; page 5, lines 9-11; page 6, lines 9-33 (as now amended); page 7, lines 1-2; and Fig. 2. As now presented, it is respectfully submitted that the invention as claimed is believed sufficiently described in the specification and drawings to meet the enablement requirement.

In addition, it is noted that Fig. 1 of the present application contains a schematic representation of copying means (C1, C2, and C3) and as discussed in the specification at least on page 1, lines 27-29; page 2, lines 1-2, 3-13, 20-22; and page 6, 12-25. With respect to such copying, it is submitted that suitable copying means and the copying (or applying) of coefficients to an adaptive (or programmable) filter is within the knowledge of one skilled in the art of adaptive filters. See for example, WO97/45995 which was incorporated by reference in the instant application, on page 4, lines 5-6.

Thus, claims 1-8 contain subject matter which is believed to be described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Withdrawal of the rejection is respectfully requested.

**Rejection under 35 U.S.C. §102**

**Claim 1:**

Claim 1 recites a system for suppressing audio distortion, comprising:

a circuit arrangement of:

echo cancelling means coupled between an audio output and a distorted desired audio sensing microphone array; and

a filter arrangement coupled to at least one selected from the group consisting of (a) the echo cancelling means and (b) the microphone array, the filter arrangement including filter coefficients representing at least a part of the audio distortion, the system further comprising:

an at least partly mirrored circuit arrangement having components that are at least partly mirrored relative to the (i) echo cancelling means and (ii) filter arrangement of the circuit arrangement, the at least partly mirrored circuit arrangement being configured to create and to copy simulated audio distortion representative filter coefficient values into the filter coefficients of said filter arrangement, wherein the simulated audio distortion representative filter coefficient values represent correlation properties of reverberant tail parts of reverberation type audio distortion of a given sound field, further for use by the filter arrangement in suppressing reverberation type audio distortion in the given sound field.

Support for amendment to claim 1 can be found in the specification at least on page 2, lines 3-13; page 3, lines 1-2, 5-8, 17-18 and 28-33; page 4, lines 17-30; page 5, lines 9-11; page 6, lines 9-33 (as now amended); page 7, lines 1-2; and Fig. 2.

As presented, claim 1 clearly articulates a novel and non-obvious system for suppressing audio distortion. The system includes a circuit arrangement of echo cancelling means and a filter arrangement including filter coefficients representing at least a part of the audio distortion and an at least partly mirrored circuit arrangement

configured to create and to copy simulated audio distortion representative filter coefficient values into the filter coefficients of said filter arrangement. In other words, the audio distortion representative filter coefficient values are the result of a simulation (see for example the present specification on page 6, lines 9-33; page 7, lines 1-2; and Figs. 1 and 2). The simulated audio distortion representative filter coefficient values represent correlation properties of reverberant tail parts of reverberation type audio distortion of a given sound field. The simulated audio distortion representative filter coefficient values are further for use by the filter arrangement in suppressing reverberation type audio distortion in the given sound field. Accordingly, the system of claim 1 advantageously enables reverberant tail part(s) of the sound field to be taken into account and, thereby, to make the system independent of the presence of speech signals.

Claims 1-8 were rejected under 35 U.S.C. §102(e) as being anticipated by Belt et al. (U.S. Patent 7,035,415; hereafter "**Belt**"). With respect to claim 1, Applicant respectfully traverses this rejection for at least the following reasons.

The PTO provides in MPEP § 2131 that  
*"[t]o anticipate a claim, the reference must teach every element of the claim...."*

Therefore, with respect to claim 1, to sustain this rejection the **Belt** reference must contain all of the above claimed elements of the respective claims. However, contrary to the examiner's position that all elements are disclosed in the **Belt** reference, the latter reference does not disclose a system for suppressing audio distortion that includes a "... *partly mirrored circuit arrangement ... configured to create and to copy simulated audio distortion representative filter coefficient values into the filter coefficients of [the] filter arrangement ... wherein the simulated audio distortion representative filter coefficient values represent correlation properties of reverberant tail parts of reverberation type audio distortion*", the simulated audio distortion representative filter coefficient values further "for use by the filter arrangement in

suppressing *reverberation type audio distortion* in the given sound field” [emphasis added] as is claimed in claim 1. Therefore, the rejection is not supported by the **Belt** reference and should be withdrawn.

In contrast, the **Belt** reference discloses a method and device for acoustic echo cancellation combined with adaptive beamforming. As disclosed in **Belt**, multiple input signals are subjected to a combination process of adaptive beamforming and adaptive echo cancelling. For each of the input signals, an individual processing history of adaptive echo cancelling data is kept and combined with current adaptive beamforming data. A storage means is provided for storing in relation to every input signal, individual processing histories of adaptive echo cancelling data for combination with current adaptive beamforming data. (see **Belt** abstract). However, **Belt** neither teaches nor suggests a “... *partly mirrored circuit arrangement* ... configured to *create and to copy simulated audio distortion representative filter coefficient values* into the *filter coefficients* of [the] *filter arrangement* ... wherein the *simulated audio distortion representative filter coefficient values* represent *correlation properties* of *reverberant tail parts of reverberation type audio distortion*” as is recited in claim 1.

Accordingly, claim 1 is allowable and an early formal notice thereof is requested. Claims 2-8 depend from and further limit allowable independent claim 1 and therefore are allowable as well. The 35 U.S.C. §102(e) rejection thereof has now been overcome. Withdrawal of the rejection is respectfully requested.

### **Conclusion**

Except as indicated herein, the claims were not amended in order to address issues of patentability and Applicants respectfully reserve all rights they may have under the Doctrine of Equivalents. Applicants furthermore reserve their right to reintroduce subject matter deleted herein at a later time during the prosecution of this application or a continuation application.

It is clear from all of the foregoing that independent claim 1 is in condition for allowance. Claims 2-8 depend from and further limit claim 1 and therefore are allowable as well.

The amendments herein are fully supported by the original specification and drawings; therefore, no new matter is introduced. An early formal notice of allowance of claims 1-8 is requested.

Respectfully submitted,

/Michael J. Balconi-Lamica/

Michael J. Balconi-Lamica  
Registration No. 34,291  
for Edward Goodman, Reg. No. 28,613

Dated: February 28, 2010  
Philips Intellectual Property & Standards  
345 Scarborough Road  
Briarcliff Manor, New York 10510  
Telephone: 914-333-9611  
Facsimile: 914-332-0615  
File: NL040037US1

ATTACHMENTS

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